

Application No. 10/633,893
Amendment dated December 21, 2005
Reply to Office Action of September 26, 2005

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A glass composition comprising the following glass ingredients:

62.5 to 75 % by weight of SiO_2 ;

1 to 16% by weight of Al_2O_3 ;

at least 0.1% by weight of Li_2O :

an amount of B_2O_3 sufficient to improve the fusibility of the glass composition but not more than 8 % by weight;

$\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{B}_2\text{O}_3$ accounting for 80.4 to 90 % by weight;

a total of 0 to 15% by weight, zero inclusive, of R_2O compounds, where R = Li, Na, and K; and

a total of 0 to 15 % by weight, zero inclusive, of $\text{TiO}_2 + \text{ZrO}_2 + \text{Ln}_x\text{O}_y$, where Ln_xO_y represents at least one compound selected from the group consisting of lanthanoid metal oxides, Y_2O_3 , Nb_2O_5 , and Ta_2O_5 .

2. (Original) A glass composition as claimed in claim 1, further comprising the following glass ingredients:

a total of 12 % or less by weight of one or two or more $\text{R}'\text{O}$ compounds, where $\text{R}' = \text{Mg}, \text{Ca}, \text{Sr}, \text{Ba}, \text{and Zn}$.

3. (Currently Amended) A glass substrate formed of a glass composition comprising the following glass ingredients:

62.5 to 75 % by weight of SiO_2 ;

1 to 16% by weight of Al_2O_3 ;

at least 0.1% by weight of Li_2O ;

an amount of B_2O_3 sufficient to improve the fusibility of the glass substrate but not more than 8 % by weight;

$\text{SiO}_2 + \text{Al}_2\text{O}_3 + \text{B}_2\text{O}_3$ accounting for 80.4 to 90 % by weight;

a total of 0 to 15 % by weight, zero inclusive, of R_2O compounds, where R = Li, Na, and K; and

a total of 0 to 15 % by weight, zero inclusive, of $\text{TiO}_2 + \text{ZrO}_2 + \text{Ln}_x\text{O}_y$, where Ln_xO_y represents at least one compound selected from the group consisting of lanthanoid metal oxides, Y_2O_3 , Nb_2O_5 , and Ta_2O_5 .

4. (Original) A glass substrate as claimed in claim 3, further comprising the following glass ingredients:

a total of 12 % or less by weight of one or two or more $\text{R}'\text{O}$ compounds, where $\text{R}' = \text{Mg}, \text{Ca}, \text{Sr}, \text{Ba}, \text{and Zn}$.

5. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate is not subjected to strengthening.

6. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate is a substrate for a magnetic disk.

7. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has a fracture toughness K_{Ic} of $0.90 \text{ MPa} / \text{m}^{1/2}$ or greater.

8. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has SiO_2 elution A in a range of from 10 to 450 ppb per 2.5-inch disk.

9. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has a fracture toughness K_{Ic} of $0.90 \text{ MPa} \cdot \text{m}^{1/2}$ or greater, and has SiO_2 elution A in a range of from 10 to 450 ppb per 2.5-inch disk, with a ratio of the SiO_2 elution A to the fracture toughness K_{Ic} in a range of from 3 to 500.

10. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has alkali elution B of 350 ppb or lower per 2.5-inch disk.

11. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate is not subjected to strengthening, and has a specific elastic modulus E / ρ of 30 or higher.

12. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate is not subjected to strengthening, and has a Vickers hardness H_v in a range of from 500 to 700.

13. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate is not subjected to strengthening, and has a linear thermal expansion coefficient α in a range of from $40 \times 10^{-7} / ^\circ\text{C}$ to $90 \times 10^{-7} / ^\circ\text{C}$.

14. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate exhibits a weight reduction factor lower than 8.0 % when kept in a melted state at 1500°C for 24 hours.

15. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has a glass transition temperature T_g of 600°C or lower.

16. (Original) A glass substrate as claimed in claim 3, wherein the glass substrate has a liquid phase temperature T_L of 1300°C or lower.

17. (Original) A glass substrate as claimed in claim 3, wherein a temperature $T_{\log \eta = 2}$ at which the glass substrate has a melt viscosity of $\log \eta = 2$ is 1 550 °C or lower.

18. (Original) A magnetic disk substrate comprising a glass substrate as claimed in claim 3 and a magnetic film formed on at least one surface thereof.

19. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate further comprises the following glass ingredients:

a total of 12 % or less by weight of one or two or more R'O compounds, where R' = Mg, Ca, Sr, Ba, and Zn.

20. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate is not subjected to strengthening.

21. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has a fracture toughness K_{Ic} of 0.90 MPa / m^{1/2} or greater.

22. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has SiO₂ elution A in a range of from 10 to 450 ppb per 2.5-inch disk.

23. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has a fracture toughness K_{Ic} of 0.90 MPa / m^{1/2} or greater, and has SiO₂ elution A in a range of from 10 to 450 ppb per 2.5-inch disk, with a ratio of the SiO₂ elution A to the fracture toughness K_{Ic} in a range of from 3 to 500.

24. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has alkali elution B of 350 ppb or lower per 2.5-inch disk.

25. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate is not subjected to strengthening, and has a specific elastic modulus E/ρ of 30 or higher.

26. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate is not subjected to strengthening, and has a Vickers hardness H_v in a range of from 500 to 700.

27. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate is not subjected to strengthening, and has a linear thermal expansion coefficient α in a range of from $40 \times 10^{-7} / ^\circ\text{C}$ to $90 \times 10^{-7} / ^\circ\text{C}$.

28. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate exhibits a weight reduction factor lower than 8.0 % when kept in a melted state at 1 500 $^\circ\text{C}$ for 24 hours.

29. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has a glass transition temperature T_g of 600 $^\circ\text{C}$ or lower.

30. (Original) A magnetic disk substrate as claimed in claim 18, wherein the glass substrate has a liquid phase temperature T_L of 1 300 $^\circ\text{C}$ or lower.

31. (Original) A magnetic disk substrate as claimed in claim 18, wherein a temperature $T_{\log \eta = 2}$ at which the glass substrate has a melt viscosity of $\log \eta = 2$ is 1 550 $^\circ\text{C}$ or lower.